

WE CLAIM:

1. A transducing head comprising:
a main pole; and
at least one magnetic element spaced from the main pole, wherein the magnetic element provides a potential return path for a magnetic field produced by the main pole, and has a first edge closest to the main pole, a second edge furthest from the main pole, wherein permeability of the magnetic element increases from the first edge to the second edge.
2. The transducing head of claim 1, wherein the magnetic element is formed of a plurality of layers, each succeeding layer having greater permeability.
3. The transducing head of claim 2, wherein a ratio of permeability between adjacent layers is approximately constant.
4. The transducing head of claim 1, wherein the magnetic element is a return pole.
5. The transducing head of claim 4, wherein the return pole has a shape selected from the group consisting of rectangular, round, and elliptical.
6. The transducing head of claim 1, wherein the magnetic element is a reader shield.
7. The transducing head of claim 1, wherein the main pole is formed of magnetic material.

8. The transducing head of claim 1, wherein the magnetic element is formed of magnetic material.
9. A transducing head comprising:
a main pole; and
at least one magnetic element spaced from the main pole, wherein the magnetic element provides a potential return path for a magnetic field produced by the main pole and is formed of a plurality of layers, each succeeding layer having greater permeability, with a highest permeability at an edge of the magnetic element furthest from the main pole.
10. The transducing head of claim 9, wherein a ratio of permeability between adjacent layers is approximately constant.
11. The transducing head of claim 9, wherein the magnetic element is a return pole.
12. The transducing head of claim 9, wherein the magnetic element is a reader shield.
13. The transducing head of claim 9, wherein the main pole is formed of magnetic material.
14. The transducing head of claim 9, wherein the magnetic element is formed of magnetic material.

15. A perpendicular write head for perpendicular recording on a magnetic medium, the perpendicular write head comprising:

a write pole;

a magnetic gap; and

a return pole spaced from the write pole by the magnetic gap and having a greater thickness than the write pole, the return pole having a permeability which is less at an edge closest to the write pole and greater at an edge furthest from the write pole.

16. The perpendicular write head of claim 15, wherein the return pole is formed of a plurality of layers, each succeeding layer having greater permeability.

17. The perpendicular write head of claim 15, wherein a ratio of permeability between adjacent layers is approximately constant.

18. The perpendicular write head of claim 15, wherein the return pole has a shape selected from the group consisting of rectangular, round, and elliptical.

19. The perpendicular write head of claim 15 and further comprising a second return pole spaced from the write pole by a second magnetic gap.

20. The perpendicular write head of claim 19, wherein the second return pole has a permeability which is less at an edge closest to the write pole and greater at an edge furthest from the write pole.